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Sustainable Community Gardens Require Social Engagement and Training: A Users' Needs Analysis in Europe

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Abstract: Urban gardens are spreading in many cities across Europe, with community gardening being a fundamental form of urban agriculture. While the literature reveals the essential role that community gardens can play in terms of learning and education, no studies have investigated the training needs for participants in community gardens to ensure their successful development. The goal of this article is to evaluate the training requirements of urban community gardens to ensure their successful implementation and their contribution to sustainability in European cities. Two questionnaires of users' needs analysis were designed and implemented in Berlin, Bologna, Budapest, and Cartagena. The results unveiled the need to re-enforce the training in the formation and community building phases of community gardens towards ensuring the creation of an engaged gardening community to maintain activity, particularly for top-down activities (e.g., research-related gardens). Users claimed their need for being trained on crop management skills (e.g., maintenance, bed preparation, organic practices) and on communication skills to further disseminate their activity, thereby increasing the potential for citizen engagement. Such requirements could be overcome with the creation of urban gardens networks, where experiences and knowledge are shared among practitioners. Policy recommendations are provided based on the outputs of this study.

Keywords: urban agriculture; community gardening; training; community building; urban planning; knowledge; lifelong learning

1. Introduction

1.1. Civil Engagement, Education, and Lifelong Learning in Urban Agriculture (UA)

In recent years, the rise of community gardens has been observed as a worldwide trend [1–3]. Urban gardens are spreading in cities all over Europe, accompanied by an increasing interest in policy, media, and research. According to Adler et al. [4], the conventional food distribution system is perceived as unsustainable by consumers owing to its transport and distribution infrastructure, which relies on the use of non-renewable resources. As an alternative, urban agriculture is perceived as an activity towards sustainability [5], providing benefits and ecosystem services [6]. Furthermore, from a social perspective, a lack of communication and trust in the system has led to the emergence of new practices, within a more local context. In fact, urban agriculture is broadly accepted in European cities [6,7], where community gardens are increasingly established as micro to small scale agriculture and are fulfilling a diversity of functions [8,9]. They vary in terms of actors, location of production, products, the scale of production and technology, types of economic activities, or market orientation [10].

Comparing community gardens to other urban agriculture activities, the goal of community gardens is typically not based on the establishment of urban agriculture as a commercial business, but on improvements in the community's food security and health, education, consumer awareness, or empowerment [11]. A study conducted by Bendt et al. [12] on the effects of public-access community gardens indicated that those gardens did not only contribute to learning about local ecological conditions, but also about urban politics and social entrepreneurship. Even though examples of entrepreneurship exist, the major aim and motivation still lies on the social improvements at the individual and community level. Aside from the improvements in food security, which has again increased as a result of economic crisis [13], urban gardens are a powerful means to establish contacts and overcome loneliness, as well as to increase knowledge, skills, and positive attitudes towards nature and environment [14,15].

The literature reveals the essential role that community gardens can play in terms of learning and education [16]. The educational role of horticulture for children is recognized by the Food and Agriculture Organization of the United Nations (FAO-UN) School Garden concept note [17], which has described the importance of school gardens to increase "the relevance and quality of education (. . .) through active learning". Past research has shown that school gardens can be a good setting for integrating and delivering many aspects of the school curriculum [16]. Exposure to hands-on gardening in any type of situation seemed to influence children in a positive way when considering the environmental variables of interest [18]. Furthermore, children were able to discover, grow and eat fresh food, make informed healthier food choices, and understand how food can start as a seed and end up on the table [16,19].

However, urban gardening, and particularly community activities, can also encourage lifelong learning among adults, especially low-skilled unemployed or jobless individuals, who risk being marginalized by society. According to the Lisbon Strategy, education and training are critical factors for increasing the economic growth, competitiveness, and social inclusion of Europe [20]. Lifelong learning is a priority for the European Union, and together with mobility, it is one of the long-term strategic objectives of EU education and training policy, as it is considered a key aspect for enhancing employment and economic success while allowing individuals to fully participate in society [21]. Lifelong learning refers to "all general education, vocational education and training, non-formal education and informal learning undertaken throughout life, resulting in an improvement in knowledge, skills and competences within a personal, civic, social and/or employment-related perspective" [21]. Usually, it is a learner-oriented process, which is possible in different methods, settings, or everyday life in interaction with other people. Lifelong learning of adults covers formal, non-formal, and informal learning for improving basics skills, obtaining new qualifications, and up-skilling or re-skilling for employment, as well as participating in social, cultural, artistic, and

societal learning for personal development and fulfilment. Lifelong learning thus encompasses the whole spectrum of formal, non-formal, and informal learning:

- Formal learning usually takes place in schools, universities, or training institutions and leads to a diploma or certificate.
- Non-formal learning includes free adult education within study circles, projects, or discussion groups advancing at their own place, with no examination at the end.
- Informal learning can be found everywhere, for example, in families, in the workplace, in non governmental organizations (NGOs), in theatre groups, or can also refer to individual activities at home like reading a book.

A study by Waliczek et al. [22] revealed how community gardens were especially important to marginalized groups, which, in this case, were composed by African-American and Hispanic gardeners. As stated by Ghose and Pettygrove [23], community gardens demonstrate that citizen participation in the context of neoliberalization can simultaneously empower and challenge citizens. Following Krasny and Tidball [14], from the perspective of learning, community gardening presents unique opportunities for multiple types of learning.

In conclusion, the literature has shown that gardening can foster the acquisition of key competences that are fundamental for individuals in a knowledge-based society, and are particularly necessary for personal development, social inclusion, active citizenship, and employment. However, no studies have investigated which are the training needs of managers and users of community gardens to ensure the successful development of sustainable community gardens.

1.2. Goal and Objectives

The goal of this article is to evaluate the requirements of urban community gardens to ensure their successful implementation and their contribution to sustainability in European cities. The specific objectives are (a) to assess the needs identified by users of community gardens in Europe; (b) to identify on-going practices that address the unveiled users' needs; and (c) to provide recommendations for future project design and management. To do so, four European cities were evaluated.

2. Methodology

This section describes the methodological framework employed and the study areas assessed in this article. To evaluate the requirements of urban community gardens, a three-step evaluation was performed, including a users' need analysis, the identification of best practices, and the shortlisting of recommendations for future implementation (Figure 1).

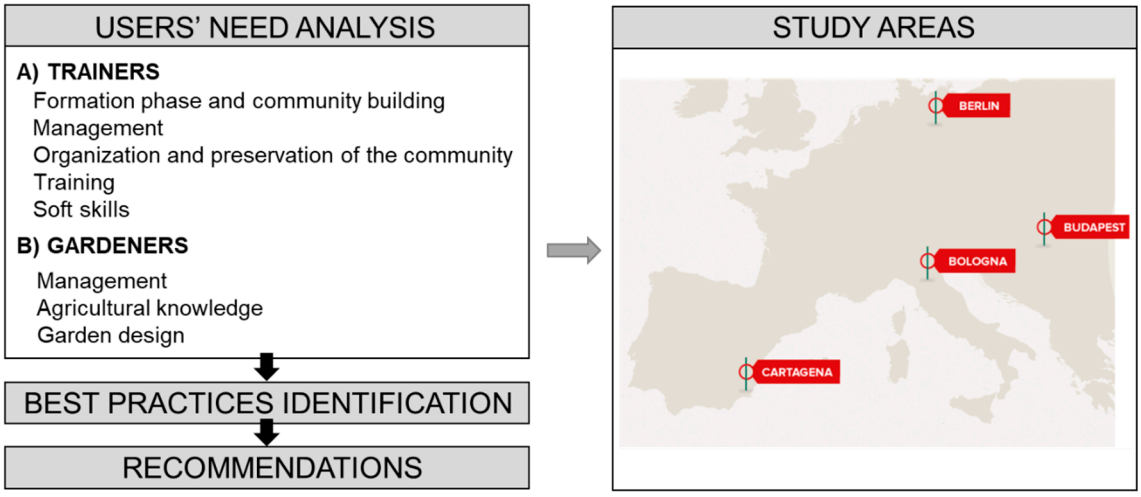

Figure 1. Methodological framework (left) and European cities selected as study areas (right).

2.1. Users' Needs Analysis

The needs analysis framework [24] was adapted for the purpose of the research study as a users' need analysis (UNA). The aim of the questionnaires was to identify and rank the competences that the managers and users of community gardens identified as needed to set-up and run an urban community garden project. Two needs analysis questionnaires (NAQ) were developed by the interdisciplinary team of the project (including agronomists, architects, biologists, educators, environmentalists, and so on), based on previous knowledge and characteristics from existing urban agriculture (UA) experiences and programs. A first NAQ (NAQ1) focused on the competences that trainers would need for educating about the creation and management of community gardens, including four areas of learning: formation phase and community building; management, organization, and preservation of the community; training; and personal skills (Table 1). A second NAQ (NAQ2) was aimed at evaluating the competences that gardeners would need in a community garden, including a total of 16 diverse competences ranging from specific agronomic knowledge to soft skills (Table 1).

Table 1. Competences evaluated in the users' needs analysis, by questionnaire. NAQ, needs analysis questionnaire.

NAQ1 (Trainers)		**NAQ2 (Gardeners)**
Area	**Competences**	**Competences**
Formation phase and community building	• Start and be part of a new community • Involve people (recruiting) • Sharing experiences in town/area • Getting to know the variety of different projects	• Preparing the garden beds • Workplace health, safety, and tools • Networking and local trading • Maintaining the garden • Designing plots • Selection of appropriate species • Reproduction and storage of seeds • Planting seedlings and direct seeding • Initiating social events • Harvest, storage, and food preparation • Propagating plants from seeds • Communication and integration • Soilless growing systems • Permaculture/organic agriculture • Composting (green recycling) • Basic office skills
Management, organization, and preservation of the community	• Get access to gardening space • Promote the community garden • Access resources and funding • Manage, coordinate, and create working groups • Conflict management and resolution • Get involved in networks • Engaging gardeners	
Training	• Conduct training needs analysis • Identify, adapt, and use existing training materials • Identify, adapt, and use appropriate teaching tools • Gardening basics * • Facilitation skills	
Personal skills	• Computer and basic Information and Communication Technologies (ICT) skills • Use of internet and social networks • Organizational knowledge (soft skills)	

For both questionnaires, the competences were evaluated with a Likert-scale, where respondents could score from low necessity (1) to high necessity (5). Such a methodological approach was chosen for determining to what extent respondents agreed or disagreed with the different proposed competences. Open-ended questions were added at the end of the questionnaires to provide a space for the respondents to include further competences to be considered. These qualitative inputs were valuable for assessing the results and for complementing the proposed NAQs.

2.1.1. Data Collection

In regards to NAQ1, the interviews were collected from key stakeholders in the four assessed cities, who were reached through social networks, mailing lists, and direct contacts. Participants in the survey were selected according to their previous experiences in the creation and management of community gardens, personal involvement in green initiatives (including guerrilla gardening or urban green mapping), participation in on-going UA initiatives (e.g., community gardens, school gardens) and in innovative urban garden experiences (e.g., soilless gardens on public housing rooftops, inter-cultural gardens), and others. Representatives from the private sectors (e.g., urban plant nurseries, companies working on urban green infrastructures) were also included in the survey.

The final NAQ1 participants were diverse in the four cities assessed. In Berlin, these included representatives of non-profit and for-profit gardeners. A mixed sample of stakeholders was recruited in Bologna, from participants in urban gardening initiatives to representatives of the private sector. In Budapest, the sample consisted of families with small children involved in community gardens and university students. Lastly, the sample from Cartagena consisted of people involved in school garden programs, in municipal initiatives for elder people, and from social groups working on agroecology and biodiversity preservation programs (seed banks).

In the case of NAQ2, interviews were collected in urban community gardens already found within the cities under assessment with the objective of integrating the greatest number of diversity typologies of existing gardens in the cities found within the sample. The interviews lasted around 15 minutes and followed the pre-designed questionnaire.

2.1.2. Sample

Data collection was performed during the year 2013 in the different cities under assessment. Sample details are provided according to city (Table 2).

Table 2. Quantity and characteristics of the sample, by study area and questionnaire.

Study Area	NAQ1	NAQ2
Bologna (Italy)	n = 30 Most of the people involved in the survey were males and females aged between 20 and 40.	n = 90 Most of the people involved in the survey were males and females aged from 40 to 70 years old.
Berlin (Germany)	n = 30 People involved in the survey were 27% male and 73% female, in the range of 28–67 years of age.	n = 30 People involved in the survey were 21% male and 79% female, aged from 30 to 40 years old.
Budapest (Hungary)	n = 30 People involved in the survey were males and females in the ages between 20 and 65 years old.	n = 30 People involved in the survey were males and females in the age of 20–65 years old.
Cartagena (Spain)	n = 30 People involved in the survey were males (36%) and females (64%) in the age range of 30–67 years old.	n = 30 People involved in the survey were males (36%) and females (64%) in the age range of 30–67 years old.

In the case of Berlin, the user needs analysis was carried out from June until August 2013, with 30 gardens in total. Twenty-nine of these were situated in the city center, and 1 on the outskirts of Berlin. The gardens represented different legal contracts (public or private ground), neighborhoods (cultural, age, and economic background), size (300–5000 m^2), economic structure (non-profit or for-profit orientation), accessibility to the public (24 hours or less), and number of active gardeners (20 to 900 persons). All gardens were legal projects and accepted, sometimes even supported, by the local government.

Regarding Bologna, the user needs analysis was carried out from April to May 2013 in urban gardens located in housing districts and peri-urban gardens located mainly in railways and roadsides. Respondents were mainly the elderly or adults, both immigrant and Italian, and to a lesser extent young people. The Bologna Province counts with 5425 urban gardens with an average size of 30–40 m^2.

The sample was comprised by community gardens, and those who had a personal involvement in green initiatives (including guerrilla gardening or urban green mapping), participation in innovative urban garden experiences (e.g., soilless gardens on public housing rooftops, inter-cultural gardens), and others. Representatives from the private sectors (e.g., urban plant nurseries, companies working on urban green infrastructures) were also included in the survey.

In Budapest, the user needs analysis was obtained from the two organizations who managed most of community gardens, the Hungarian Contemporary Architecture Centre (three gardens) and the Urban Garden Association (also managed three gardens). One garden was organized by Youths from the Hungarian Countryside Foundation. The gardens started to work with the support from the local authorities in 2012 and 2013. The seven gardens had a total of around 10,000 m^2 and were located in different districts.

Lastly, the user needs analysis in Cartagena was obtained from people involved in municipal school gardens, municipal allotments located in public metropolitan parks, and private allotments spread around the cities of Cartagena and Murcia. The survey was carried out among elderly people who were actively involved in a community garden. The community gardens in Cartagena numbered 14 with an average size of 20–60 m^2, and there were also 35 school gardens managed by non-profit associations.

2.1.3. Data Analysis

Descriptive statistics were used to quantitatively analyze the results from the survey. Likert-scale results were displayed individually and as average results.

2.2. Identification of Practices

For further assessment, specific case studies were selected (Allmende Kontor in Berlin, Via Gandusion in Bologna, ZUGkert in Budapest, and the experiences from Universidad Politécnica de Cartagena—UPCT—and the CEAMA foundation in Murcia) to delve deeper into the practices and needs of gardeners and trainers in the respective case study areas. Urban community gardening initiatives were identified for each city through targeted contacts (i.e., UA stakeholders), desk research (i.e., websites), fieldwork visits during the data collection, and snowball sampling. A case study was chosen from the existing initiatives in each city with the aim of evaluating how the users' needs identified in the assessment were addressed in real experiences. The goal of this evaluation was to individualize best practices and complete a set of recommendations for future community gardening initiatives in Europe.

2.3. Study Areas

Four study areas in Europe were selected for the assessment: Berlin (Germany), Bologna (Italy), Budapest (Hungary), and Cartagena (Spain), as representative cities in the development of urban agriculture and community gardens in Europe.

2.3.1. UA in Berlin (Germany)

In Berlin, there has been a history of urban gardening for decades. However, in the 1990s, a new movement started with a strong focus on community building. Gardeners started community gardening in contrast to individual gardening, provoking an intense social interaction and intercultural exchange. Gardens were initiated in public, half-private, and private spaces, for example, urban spaces owned by associations. They addressed a broad variety of people and often provided space for individual and societal changes. The use was multifunctional, ranging from gardening to environmental education, nutrition, and political issues. Community gardens were initiated especially in densely built areas of Berlin where people had little access to green spaces [25]. In 2012, there were more than 100 urban community gardens in Berlin (stadtacker.net) with an increasing trend. Concepts varied from non-profit to economic orientations, from harvesting individually or in common, from food production to education, and from mobile to stable locations [26].

2.3.2. UA in Bologna (Italy)

The city of Bologna has become a frontrunner within the urban agriculture movement in Italy [6]. During the last 40 years, a rapid growth of urban gardens has been observed, including both grassroots and municipality-supported initiatives [27]. Notwithstanding that the number of urban gardening activities has recently stagnated, the variety of urban agriculture typologies has increased, with the appearance of new gardens for migrants, community practices, or squatted gardens. Also, Bologna was the first Italian city to host a rooftop community garden, which was supported by the city council, the local university, and an environmental association [28]. Beyond this municipally-supported experience, most of the community gardening initiatives of Bologna are self-managed and often in squared spaces (e.g., former military buildings, abandoned neighborhoods), which tend to generate a conflict with the local administration, who insists on promoting specific types of urban agriculture to suffocate neighbors' claims [27].

2.3.3. UA in Budapest (Hungary)

Following the pattern of Western Europe in 2010–2012, community gardens appeared in most Central and Eastern European countries. In Budapest, the dynamics of setting up community gardens have been accelerated in recent years [29]. From five community gardens in 2012, Budapest now counts with 30 community gardens in operation and 6 planned initiatives. A great upswing was observed in 2014–2015, although at present, it seems to have slowed down, as the activities of the main initiators and organizers have decreased. With regards to the type of gardens, from the beginning, two typical building environments could be observed: the currently-dominant housing estate/block of flats installation, and the unbuilt real estate of the areas of downtown gentrification. The community gardens in Budapest are unused or under-utilized urban areas—most often linked to residential housing construction, where they also play promotional functions. According to the sociological approach, community gardens in Budapest are semi-public, common areas.

2.3.4. UA in Cartagena (Spain)

Contrary to the rest of Spain, community gardens in Cartagena are still poorly developed. A few initiatives have managed to endure over time, mainly educational initiatives in elementary schools and high schools. Municipal initiatives have barely prospered, and despite the diverse projects carried out, these are still stalled. The social activities of various groups are noteworthy, although still very few. These initiatives are based on the individualized use of land (allotments) and are located on the outskirts of the city. The main challenges of UA in Cartagena are the location of the city, found within a highly technical agricultural environment, and the scarce vocation for the preservation of agricultural culture. Educational initiatives and agroecology-based social community gardens (e.g., ecology and conservation of local varieties) are exceptions, while the rest of the models of community gardens are in decline. In the capital city (Murcia) of the region, UA is completely different as compared with Cartagena. The conservation of traditions linked to the Huerta de Murcia (vegetable garden of Murcia), as landscape and territorial models of sustainability, have favored the appearance of municipal allotments in Murcia. However, municipal allotments have not evolved and are still based on the individualized use of land.

3. Results and Discussion

This section details the results from the users' needs analysis including both the training for community gardens' managers and users. The results are assessed at the global level (including the results from the four study areas) and at the regional level (individual cities). The last section presents a case study from each city to introduce best practices towards social engagement and training in community gardens.

3.1. Global Users' Needs in Europe

Figure 2 displays the average results for the four cities under assessment, differentiating between the skills for managers and for users. In general, training needs were mainly qualified as high or very high (above 3). Comparing the training needs between managers and users, the respondents slightly valued the manager skills higher (3.7) than those for users (3.5).

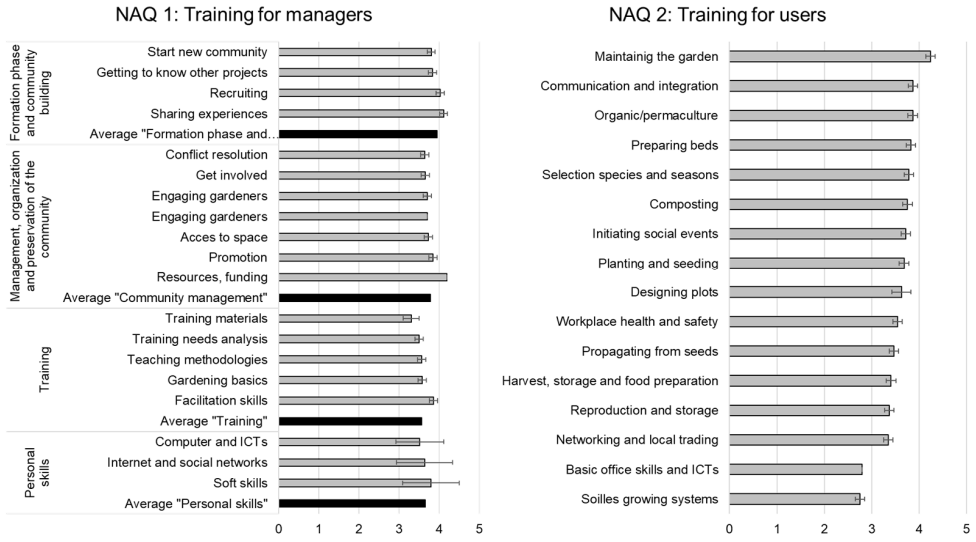

Figure 2. Global training needs analysis: Average results for the four study areas for needs analysis questionnaire 1 (NAQ1) and NAQ2. Bars indicate standard error.

Regarding the training for managers, the valuation of the skills ranged between 3.3 and 4.2, highlighting that training needs are highly demanded for managing a community garden. Most of the skills were valued between 3 and 4 in the needs analysis questionnaires, apart from resources (funding), sharing experiences, and recruiting, which were the most demanded skills (values above 4). Contrarily, the least demanded skills for managers were training materials, training needs analysis, and computer and Information and Communication Technologies (ICTs). Differentiating between the four areas of knowledge evaluated, the highest valued ones were "Formation phase & community building" (3.9) and "Management, organization, & preservation of the community". "Personal skills" (3.6) and "Training" (3.5) obtained slightly lower results.

The most demanded skill focused on how to obtain resources (funding), which is a key aspect for keeping grassroots urban agriculture projects alive worldwide, such as community gardens [30]. This aspect is independent from the type of project. On the one hand, top-down projects that start with funding from the administration risk failure once the participants need to raise enough resources for maintaining the garden and the community. On the other hand, bottom-up projects promoted by citizens struggle to raise enough funding. Gasperi et al. [27] exemplified such risk in different urban agriculture projects in Bologna (Italy). Furthermore, in cities where the local government promotes urban agriculture through specific funding programs, such as New York (United States), the access and distribution of these are unequal among the population, which may result in injustices in the institutional support of urban agriculture initiatives [31].

Sharing experiences was unveiled as the second-most demanded skill. Recent studies on innovation in urban agriculture highlighted the role of urban food projects networks [3,32]. The exchange of knowledge and experiences between practitioners (including both managers and users) results in a source of practical learning for urban gardeners, which allows for overcoming certain barriers that are specific to the urban environment. Accordingly, city-wide networks of urban agriculture projects have been created in cities such as Berlin, where multiple typologies of urban food projects can be found.

The engagement in networks is also central for improving the capacity of recruiting participants for the community gardening project, which was the third-most valued skill. Gasperi et al. [27] highlighted that top-down projects promoted by the local administration tended to fail if the municipality did not manage to engage enough citizens in the project. Most of the top-down projects that were planned and implemented without including the citizens were also rapidly abandoned by the society, who expected other types of municipal interventions in the neighborhood that were more urgent than an urban garden. On the contrary, grassroot projects such as community gardens were more successful in attracting citizens to participate as they were planned and set in urban areas where the urban garden could have specific functions (e.g., food security, cultural exchange, political engagement).

With regard to users, all the skills were valued above 3.3, with the exception of soilless growing systems and basic office skills and ICTs (2.8). Only one skill was valued above 4: maintaining the garden (4.2). The most valued skills were related to two main areas of knowledge: gardening and communication. On the one hand, maintaining the garden, organic/permaculture practices, preparing beds, selection of species, seasons, and composting were the most valued gardening skills. Indeed, the lack of knowledge is a risk that is associated with urban agriculture practices, such as rooftop agriculture [33], and professional activities tend to hire experts on agriculture to overcome this limitation in the urban context [34]. On the other hand, communication and integration as well as initiating social events were highly required communication skills. This group of skills is highly related to the recruitment training needs highlighted at the management level.

3.2. Regional Assessment

Comparing the results at the city level (Figures 3 and 4), the level of development of urban agriculture around the city was a determinant factor. On one hand, Berlin and Bologna represent cities with a high diversity of urban agriculture typologies and many urban gardening experiences with several years of experience. Conversely, Budapest and Cartagena are cities where urban agriculture is rather new. The difference between the two groups can be observed in the results of needed skills, which were lower in Berlin and Bologna as compared with Budapest and Cartagena. These differences were less evident for some specific skills, such as resources (funding) and promotion, at the management level, or networking and local trading, at the user level.

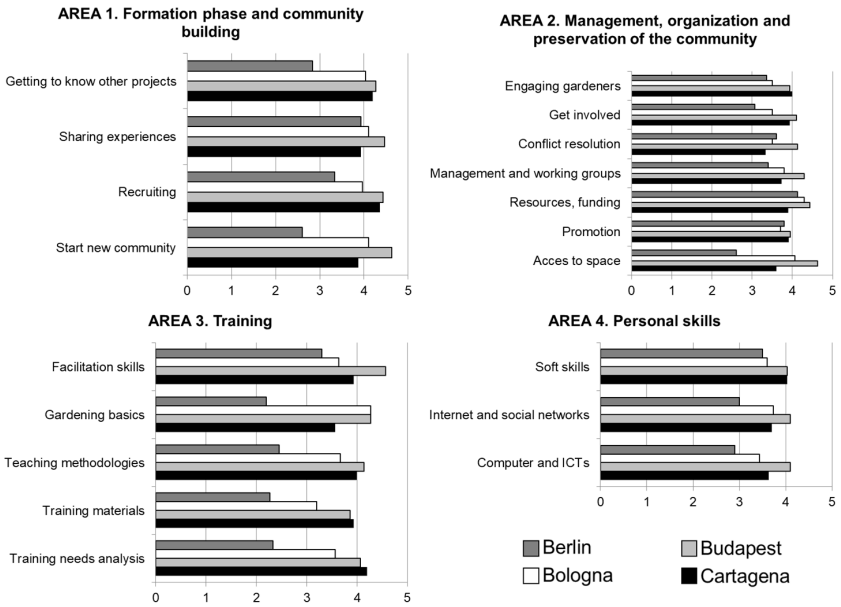

Figure 3. Regional results for NAQ1 regarding competences required by managers of community gardens, according to city and competences area. The graphs display average results from the Likert-scale. Bars indicate standard deviation of results in the sample.

In the case of Berlin, the sample purposely addressed a heterogeneous group of gardens and their initiators. Therefore, a large variety of skills was already represented in the gardens. Most questionnaire-guided interviews showed that there was a large amount of pre-knowledge already, showing low to medium user needs (see Figure 4); while the scale had values of up to 5, the gardeners' user needs did not score higher than 1.9 in any of the proposed topics. Interestingly, gardening skills such as organic agriculture or design showed the lowest perceived needs of gardeners, while initiating social events, workplace health, and preparing garden beds showed higher needs. The open-ended questions of the questionnaire confirmed this picture; they revealed conflicts and created communication, especially with the lack of time of the garden initiators. Initiating garden events could address this. Another main topic was the exchange between different garden projects, representing the need to interact with and support each other.

Regarding Bologna, most of the elements proposed in the questionnaires were considered by survey participants, who rated them as very relevant. Above all, their interest was greater in receiving training on how community experiences start and grow, as well as how they can access funding, become structured in working groups, and promote themselves through social networks. It should be noted that 50% of the interviewees highly rated, with a 5 (and 83% with 4 or above), in the need for training in gardening basics; figures that reflect the fact that most of the participants in NAQ1 were people with limited agricultural background. This was probably because of the origin of the two different social groups involved in the surveys; one of them (67%) was mainly constituted by elder urban farmers already involved in municipal gardening programs, and the other (33%) was composed of younger people with less farming experience, recruited from the survey of NAQ1, more familiarized with community engagement, networking, computer skills, and so on, than with gardening techniques.

Lastly, Budapest and Cartagena showed similar results. The sample from Budapest included participants from newly-started initiatives and with limited experiences in urban horticulture, and expressed a major need for receiving gardening skills. In Cartagena, urban garden initiatives had recently been increasing, but on the contrary, the knowledge in garden basics of the urban farmers was higher than in Budapest because of the agricultural background of the survey participants.

3.3. Community Gardening Practices towards Social Engagement and Education in Europe

In this section, case studies for each of the cities are evaluated with the aim of unveiling practices that cover the needs of the users of community gardens, thereby supporting the training and the feasibility of this typology of urban agriculture.

3.3.1. Berlin: The Allmende-Kontor

The German reference garden, the Allmende-Kontor community garden, was founded in April 2011 by workstation ideenwerkstatt berlin e.V., an association dedicated to building a network of community gardens and urban agriculture and to enable the cooperation between garden initiatives, foundations, research, and government in Berlin and across Germany. By August 2011, there were around 300 raised beds and 900 active gardeners in the 5000 m^2 garden. Gardeners were mainly from the neighbourhood with a very mixed background concerning age, education, language, cultural, and income level, seeking gardening or social interaction on the vacant land of the former Tempelhof airport, in the south of the city.

Within the Horticulture in Towns for Inclusion and Socialisation (HORTIS) project, training courses were offered to address individuals who were not involved in political or social initiatives yet, requiring a low threshold access without communicational or monetary requirements [35]. Thus, the courses were set up as a puzzle-system, enabling participation alone without having to commit to all the following courses. The HORTIS trainers' and pilot courses scheduled in 2013 and 2014 were hosted in the Allmende-Kontor garden and other urban community gardens in order to spread the knowledge broadly and to enable network and support between different projects. A specific focus was placed on social and political issues such as urban development, food sovereignty, commons, and cooperative behaviour. With that in mind, the HORTIS project addressed the niche of people with low access to education.

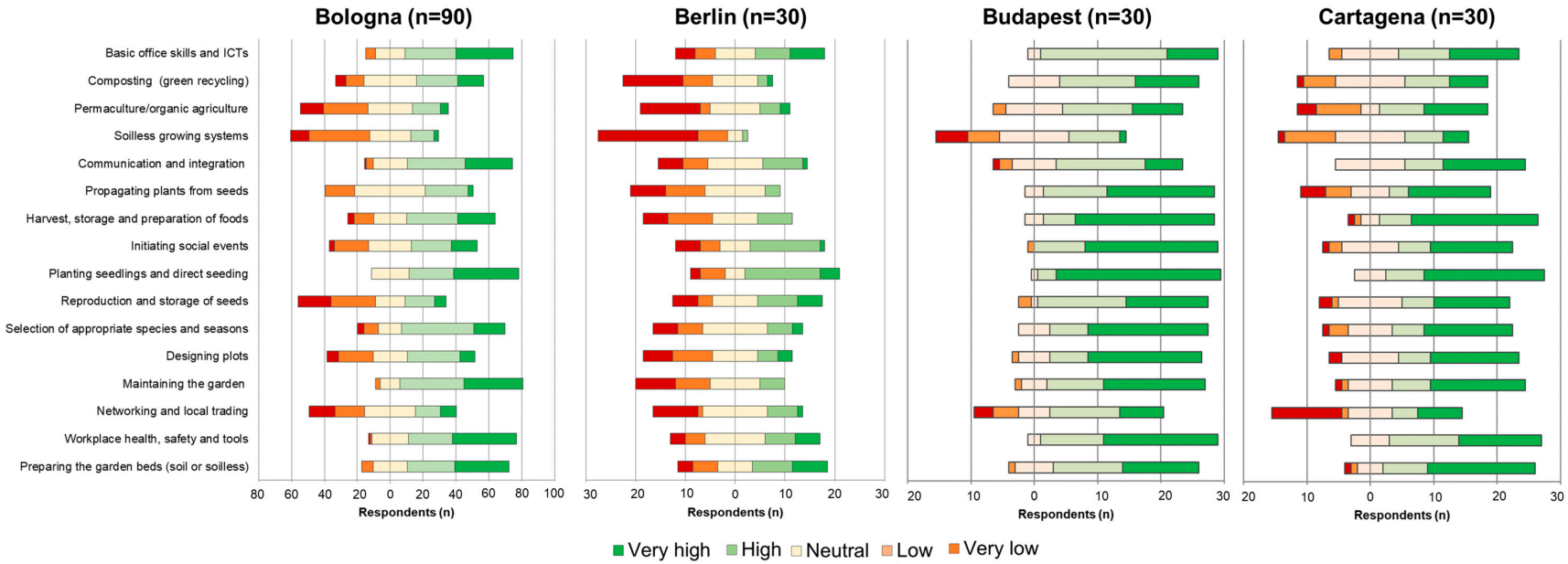

Figure 4. Regional results for NAQ2 regarding competences required by gardeners in community gardens, according to city. The graphs display the answers to the questionnaire as a Likert-scale, where the respondents evaluated the need for training on the specific competences.

3.3.2. Bologna: Via Gandusio Community Rooftop Garden

The rooftop community garden of Via Gandusio, in the city center of Bologna, was created by a collaboration between the city council of Bologna, the University of Bologna and the local association Biodivercity. The 250 m^2 garden was placed at the top of a public housing building that hosted both old Italians, former migrants from the South of Italy in the 60s, and international migrants, from the new waves of migration (e.g., from Africa, Asia). The top-down project aimed at creating a place where the two groups of people could participate and interact, fostering the creation of an intercultural community.

The implementation of the community garden was primarily undesired by the inhabitants. A social mediator from the city council was needed to settle the first group of participants (around 10 inhabitants from the building). During the two first years of the garden, the project was supported by the University of Bologna, who taught the inhabitants about different gardening techniques (i.e., soil gardening with compost, soilless techniques for nursing). The participants were very pleased with this training. However, once the university finished the intervention, some participants slowly abandoned their participation in the garden and a smaller community remained engaged in maintaining the gardening activity (around four people). The active garden managers disseminated the activities of the garden in social media (e.g., Facebook) and organized public activities to invite citizens to visit and enjoy the garden (e.g., concerts). However, the location of the garden in a specific building and the need to lock the garden because of vandalism were clear barriers for gaining new participants for the project. From 2017 on, the entire building underwent major structural works and the garden was dismantled.

3.3.3. Budapest: The ZUGkert Community Garden

The Zugkert community garden was created by the work of the Civilian Self-Organizing Group in 2014. The garden was initiated and organized by some of the most active civilian hands, which was preceded by a wide-ranging consultation with the local residents, processing of the experiences of existing community gardens, and careful planning. In order to use the land, the garden needed financial support for the initial investment—in close cooperation with the local government—and in order to set up a garden, a population group established a civil association. The garden was designed to host 64 beds measuring 10 m^2 each. The users were mainly families, but also included two primary schools and one kindergarten. The gardening community was also active in programs offered for the general public, including regular training organized with invited speakers and guests. At the project implementation, the dynamic personality of the garden coordinators and some members was decisive. Through active involvement in social media (Facebook group and website), the community was able to keep in touch with up-to-date information. Thanks to these elements, a second garden was opened in 2018.

3.3.4. Cartagena: The Campus UPCT Community Garden and the CEAMA Reference Garden

The Campus UPCT Community Garden was initiated and organized in 2014 by trainers from the HORTIS project training courses. The garden gathered civilians, workers, and students of the university as participants. Notwithstanding that originally, the garden needed financial support, which was provided by the university, it was progressively self-financed by the users themselves. The participants established a civil association where students (national or international) and any other civil resident could take part in the project. The garden was organized in a central common area and in twelve individual plots measuring 10 m^2 each. Vertical structures were also included in the garden design, resulting from workshops organized in the garden where students built different systems. Communication was performed through social media (i.e., Facebook group and a blog), where they updated and keep in touch every week.

Unfortunately, the garden's coordinators abandoned the project one year later and the gardeners' group was dissolved, overall showing the crucial role played by a strong coordination role in the continuity of these initiatives. The one-year experience was very successful, and included the organization of several social and educational events.

Another interesting experience was the CEAMA reference garden in the village of Bullas. The garden was created to recover, preserve, and promote rural culture through the use and management of the urban garden. Therefore, in the CEAMA garden, the rural knowledge and skills were employed as the basis for urban agriculture.

4. Policy Recommendations

On the basis of the results of this study, policymakers promoting urban agriculture should consider the outputs from this study to better ensure the successful implementation and maintenance of community gardens:

- Community garden programs should include training courses towards ensuring that both managers and users acquire the specific skills required for a successful implementation of a project.
- Programs supporting community gardens should envision the plurality of experiences and their diverse goals.
- The implementation of a top-down project must include follow-up interventions to ensure the proper development of the activity once the initial support ends.
- Partnerships with knowledge providers (e.g., universities, local associations) can fulfil the training gaps in certain skills, such as gardening skills or communication skills.
- Urban agriculture programs must embrace the interdisciplinarity required for a successful design and development of policies and projects, where plural backgrounds are essential (e.g., agronomy, urban planning, social mediation, economy, communication).
- The implementation of community gardening may ensure the availability of different types of resources (e.g., land, funding) and evaluate how the implemented activities can access them once the administrative support ends.
- In particular, land access can be a constraint for community gardening initiatives as municipal programs do not guarantee land access for a long term, but only for short-term interventions (e.g., two years) [27]. Therefore, policies promoting such activities should focus on overcoming such barriers and developing mechanisms to guarantee long-term land access.
- City-scale policies around urban agriculture might consider the creation of a network of experiences in order to enhance the exchange of knowledge and experiences among practitioners.
- The integration of urban agriculture within city plans cannot overlook the local environment, the existing experiences, and the motivations behind gardening. Depending on the city context, urban agriculture may be mainly driven, for instance, by the citizen needs (e.g., to perform open-air activities, to engage in political actions, to create social relationships, or to improve to living quality of a neighborhood). Understanding the role and functions that urban agriculture can play in each city and region may allow to design effective policies and achieve long-term sustainability of the interventions.

5. Conclusions

This article assessed the training needs in community gardens of four European cities where urban agriculture has spread over the last decades (Berlin, Bologna) or where urban agriculture has recently started (Budapest, Cartagena). While some literature has investigated the learning processes in urban agriculture, no studies have assessed the training needs yet. This study thus contributes to the literature with new knowledge on what training is needed to ensure the successful implementation of urban community gardens towards promoting their contribution to sustainability. Also, the study

assessed these training needs at two levels: management and users. This article contributes to the literature by detailing best practices for the development and management of community gardens towards overcoming barriers of this type of urban agriculture. The outputs from these case studies (both positive practices and challenges) contributed to the identification of policy recommendations for future policies and programs to enhance community gardens.

Training needs at the management level revealed the difficulties of community gardens in the formation phase and community building, where citizens engage for creating a group of gardeners that participate in the gardening project. This was more severe in top-down activities (e.g., research-related gardens), where the initial gardener group created during the implementation of the specific project was reduced or vanished once it ended. The described case studies were active on social media or hosted public events (e.g., concerts), opening the garden to the citizens and increasing the chance for new participants to become involved. Along the same line, top-down projects struggled with the financial resources needed to maintain the gardening activity beyond the original project deadline, and the training needs in this aspect were very relevant. With these barriers to overcome, case studies also showed that active leadership was crucial for maintaining the activity.

At the users' level, the need of being trained in crop management skills (e.g., maintenance, bed preparation, organic practices) and in communication skills was highlighted, and this was especially true in cities (Budapest, Cartagena) where the interest in urban agriculture has only recently emerged. The described case studies were of a different nature; some gardens had a political and social goal, others more educational, showing the diversity in the goals of community gardening initiatives. Specifically, some of them included the participation of agriculture knowledge centres (i.e., universities, local associations) that trained the participants in gardening skills. Other cases where agricultural skills were limited followed training opportunities within the HORTIS project to increase their knowledge in gardening. However, beyond the use of social media, community gardeners struggled with communication to further disseminate their activity, thereby increasing the potential for citizen engagement. Such requirements could be overcome by the intervention of the local government, which can promote the creation of city-wide urban garden networks towards the exchange of experiences and knowledge among practitioners. The lessons learned from the described case studies allowed identifying policy recommendations for future policies.

This study had some limitations that could bias the results and the comparability between cities. First, the sample was not homogeneous among the different cities, as the reality of community gardening was different in the assessed cities, including their diffusion at city level (e.g., common and structured in Berlin, while newly emerging in Cartagena). Therefore, while parts of the sample were heterogeneous and included multiple stakeholders, other samples were focused on those engaged in community gardens (e.g., university students). Second, the questionnaires were designed top-down and the options were defined by the researchers rather than developing a previous phase to define the content of the questionnaires with the stakeholders (e.g., qualitative interviews, participatory workshops). In this sense, further research could focus on overcoming these limitations with adapted methodological frameworks to further investigate training needs in community gardens. Also, the evaluation of other typologies of urban agriculture (rooftop gardens, allotments) and other cities in Western Europe could provide us with further data and evidence to sustain our findings. Lastly, further research could evaluate how the identified policy recommendations are implemented in current and future policies.

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